



GRADE 12
DIPLOMA EXAMINATION

Biology 30

June 1987

Alberta
EDUCATION

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BIOL 30 - 872

MULTIPLE CHOICE KEY

1. A
2. B
3. C
4. B
5. D
6. C
7. D
8. A
9. B
10. A
11. A
12. D
13. D
14. C
15. A
16. B
17. B
18. D
19. A
20. D
21. B
22. C
23. D
24. D
25. D
26. C
27. D
28. A
29. C
30. C
31. D
32. A
33. B
34. B
35. A
36. A
37. D
38. D
39. C
40. A
41. C
42. B
43. B
44. A
45. C
46. C
47. B
48. D
49. B
50. C
51. B
52. C
53. B
54. B
55. C
56. A
57. C
58. C
59. B
60. C
61. A
62. D
63. A
64. C
65. C
66. D
67. C
68. D
69. C
70. B
71. D
72. A
73. B
74. D
75. A
76. B
77. D
78. A
79. A
80. C

78. A

SAMPLE ANSWERS TO THE WRITTEN-RESPONSE SECTION

Note: The responses that follow represent ONE approach to each of the problems. During the diploma examination marking session, provision is made for considering the various approaches students may have used.

(2 marks) 1. Name and describe a method by which particles too large to pass through cell membranes enter cells without the aid of carrier molecules.

1 mark - phagocytosis

OR

- pinocytosis

OR

- endocytosis

1 mark - an infolding of the cell membrane

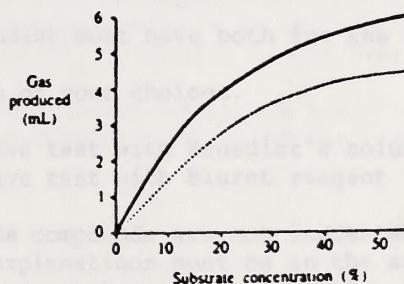
OR

- engulfing of the particles or liquid by the cell membrane

Use the following information to answer question 2.

Enzyme-catalyzed Reactions

— Results using substrate and enzyme
- - - - - Results using substrate, enzyme, and a constant amount of inhibitor



NOTE: the amount of enzyme in each reaction is equal.

(2 marks) 2. a. What effect does the inhibitor have on the reaction rate?

1 mark - it decreases the reaction rate

OR

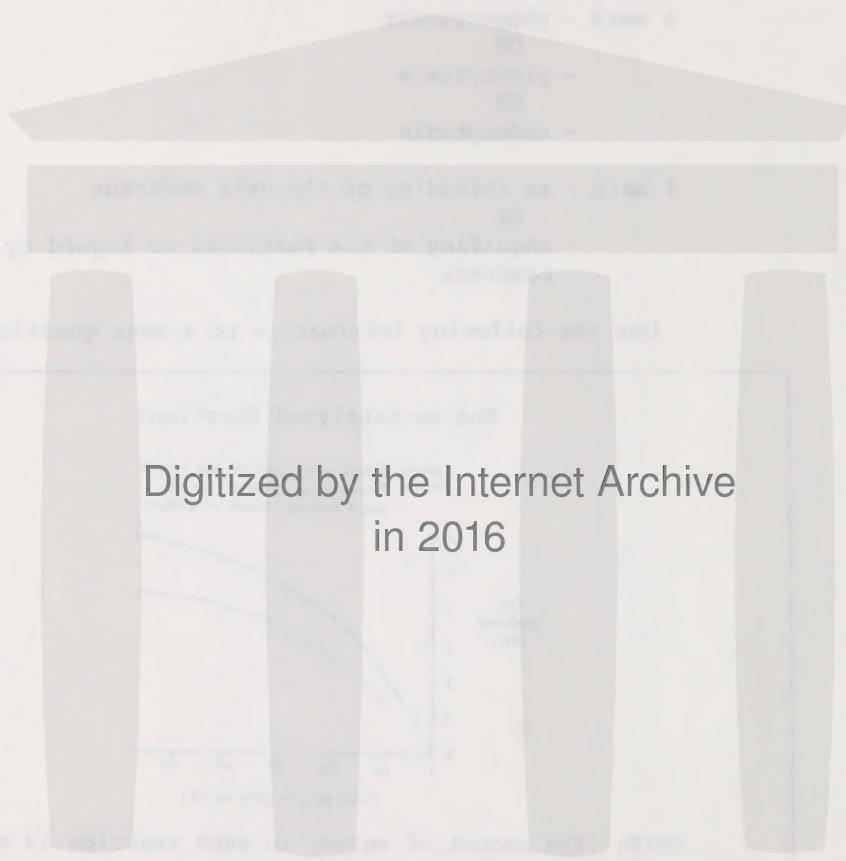
- it decreases gas production

b. Explain how the inhibitor causes this effect.

1 mark - the inhibitor competes with the substrate for the enzyme's active site

OR

- the inhibitor prevents the enzyme from fully catalyzing the reaction



Use the following information to answer question 3.

A student was given an aqueous solution containing a mixture of a number of organic compounds and was asked to determine what substances were present. The student placed 2 mL of the mixture in each of four test tubes marked W, X, Y, and Z, added the reagents shown, and noted the results. The student repeated the procedure and obtained similar results.

<u>Test Tube</u>	<u>Reagent Added</u>	<u>Results</u>
W	Benedict's solution*	positive
X	Sudan IV powder	negative
Y	Biuret reagent	positive
Z	Iodine solution	negative

*The unknown mixture and the reagent were heated in a hot water bath for one minute.

(3 marks) 3. a. What TWO organic compounds present in the mixture were indicated by the tests?

1 mark for BOTH of the following:

- (i) reducing sugar
- (ii) protein

NOTE: A student must have both for the mark

b. Explain each of your choices.

- (i) positive test with Benedict's solution
- (ii) positive test with Biuret reagent

NOTE: If the compounds are not indicated in (i) and (ii), the explanations must be in the same order as the unknown substances in the table.

(2 marks) 4. In preparation for the 1968 Olympics in Mexico City (which is at a high altitude), athletes trained in regions of high altitude. Provide a PHYSIOLOGICAL EXPLANATION as to why these athletes trained at a high altitude.

1 mark - at high altitudes there are lower O₂ levels

1 mark - decreased O₂ stimulates RBC production

(6 marks) 5. The kidney may be viewed as an organ of retention rather than as an organ of excretion. Identify a substance retained by each of the processes below and explain how it is retained.

a. filtration

1 mark - RBC or WBC or plasma proteins or platelets
1 mark - large molecules or cells do not usually pass through the glomerulus

b. reabsorption

1 mark - glucose or amino acids or fatty acids

1 mark - active transport

OR

- water

- osmosis

OR

- NaCl

- diffusion

c. release of ADH

1 mark - water

1 mark - ADH makes the collecting ducts and the upper portion of the distal tubules permeable to water

(2 marks) 6. The sympathetic and the parasympathetic nervous systems work together to maintain homeostasis in the human body. Explain how this statement applies to control of the heart rate.

1 mark - sympathetic nerve causes heart rate to increase

1 mark - parasympathetic nerve causes heart rate to decrease

(3 marks) 7. a. Compare body temperatures with and without a functioning corpus luteum.

1 mark - higher with a functioning corpus luteum

b. Describe how body temperature changes just before ovulation.

2 mark - decreases

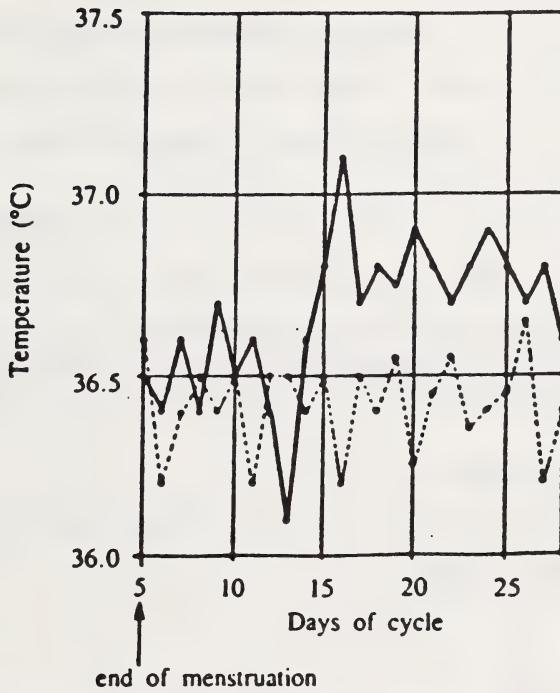
c. Describe how body temperature changes just after ovulation.

1 mark - increases

Use the following information to answer question 7.

Relation Between Body Temperature and the Menstrual Cycle from Days 5 to 28 in a Typical 28 Day Cycle.

— Cycle with ovulation
- - - Cycle with no ovulation



(3 marks) 7. a. Compare body temperatures with and without a functioning corpus luteum.

1 mark - higher with a functioning corpus luteum

b. Describe how body temperature changes just before ovulation.

1 mark - decreases

c. Describe how body temperature changes just after ovulation.

1 mark - increases

**GRADE 12 DIPLOMA EXAMINATION
BIOLOGY 30**

DESCRIPTION

Time: 2½ hours

Total possible marks: 100

This is a **CLOSED-BOOK** examination consisting of two parts:

PART A: 80 multiple-choice questions each with a value of 1 mark.

PART B: Seven written-response questions for a total of 20 marks.

GENERAL INSTRUCTIONS

Fill in the information on the answer sheet as directed by the examiner.

For multiple-choice questions, read each carefully and decide which of the choices **BEST** completes the statement or answers the question. Locate that question number on the answer sheet and fill in the space that corresponds to your choice. **USE AN HB PENCIL ONLY.**

Example

This examination is for the subject area of

- A. Chemistry
- B. Biology
- C. Physics
- D. Mathematics

Answer Sheet

A B C D

① ● ③ ④

If you wish to change an answer, please erase your first mark completely.

For written-response questions, read each carefully, show all your calculations, and write your answer in the space provided in the examination booklet.

NOTE: The perforated pages at the back of this booklet may be torn out and used for your rough work.

DO NOT FOLD EITHER THE ANSWER SHEET OR THE EXAMINATION BOOKLET

The presiding examiner will collect the answer sheet and examination booklet for transmission to Alberta Education.

JUNE 1987

PART A

INSTRUCTIONS

There are 80 multiple-choice questions with a value of one mark each in this section of the examination. Use the separate answer sheet provided and follow the specific instructions given.

NOTE: The perforated pages at the back of this booklet may be torn out and used for your rough work.

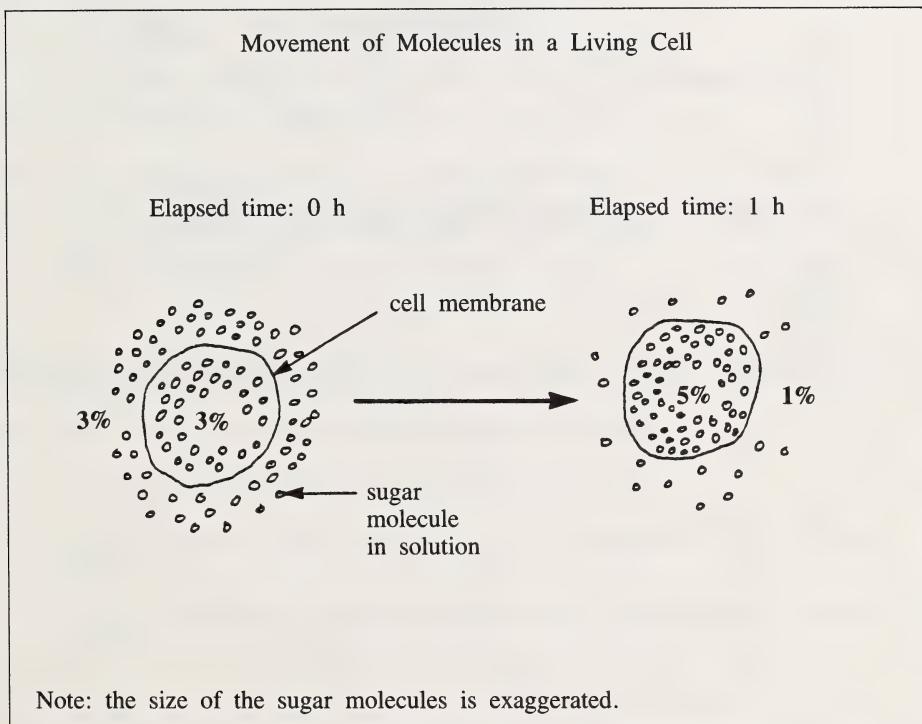
WHEN YOU HAVE COMPLETED PART A, PROCEED DIRECTLY TO PART B

**DO NOT TURN THE PAGE TO START THE EXAMINATION UNTIL TOLD
TO DO SO BY THE PRESIDING EXAMINER**

1. Organelles which contain enzymes that help to break down dead or dying cells are
 - A. lysosomes
 - B. ribosomes
 - C. centrioles
 - D. mitochondria

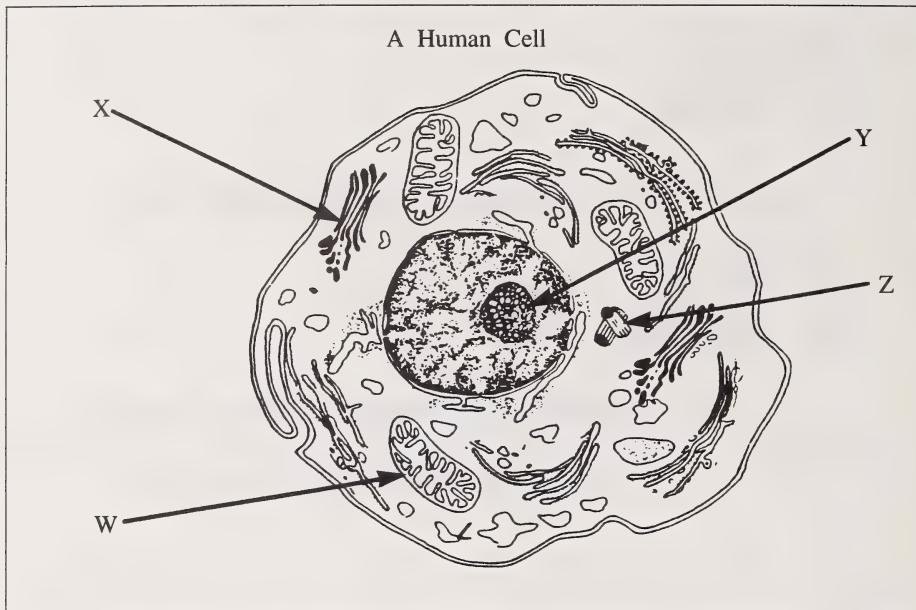
2. In which cells would you expect to find the most Golgi bodies?
 - A. Hair cells
 - B. Gland cells
 - C. Muscle cells
 - D. Red blood cells

Use the following information to answer question 3.



3. The change in sugar concentration in the cell after one hour is primarily due to
 - A. diffusion and the use of ATP
 - B. osmosis and the production of water
 - C. active transport and the use of ATP
 - D. endocytosis and the production of oxygen

Use the following information to answer question 4.

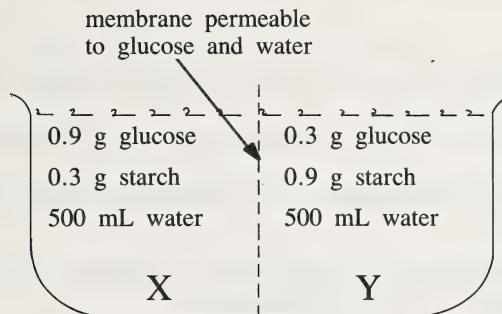


4. The structure that packages material for secretion is labelled

- A. W
- B. X
- C. Y
- D. Z

Use the following information to answer question 5.

Diffusion Experiment



5. The final distribution in the diffusion experiment will be

- A. 0.6 g of glucose and 1.2 g of starch in side Y
- B. 1.2 g of glucose and 1.2 g of starch in side Y
- C. equal amounts of glucose and starch in sides X and Y
- D. equal concentrations of glucose in sides X and Y

6. Oxygen continually moves from red blood cells into tissues by diffusion because

- A. there is a lower concentration of oxygen in the blood
- B. there is a higher concentration of oxygen in the tissues
- C. oxygen is used in cellular respiration and its concentration is lower in the tissues
- D. oxygen is produced by cellular respiration and its concentration is higher in the tissues

7. Blood plasma contains 20 times more sodium ions than potassium ions, whereas a red blood cell in the plasma contains 20 times more potassium ions than sodium ions. These concentration differences are the result of

- A. osmosis
- B. diffusion
- C. endocytosis
- D. active transport

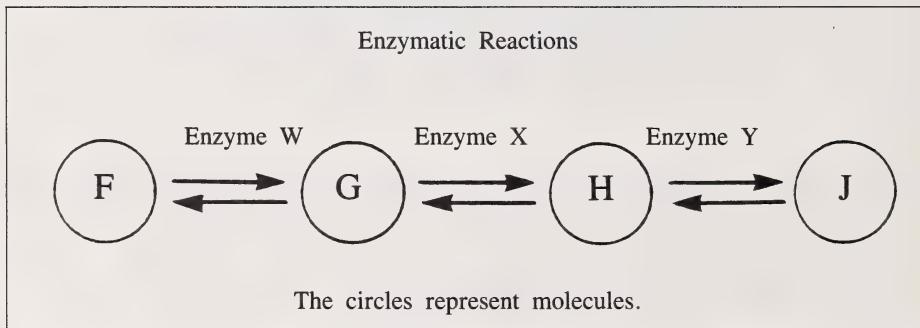
8. During an enzymatic reaction, the substrate bonds to the enzyme's

- A. active site
- B. inhibitory site
- C. regulatory site
- D. homeostatic site

9. Which situation describes a possible negative feedback system?

- A. A person becomes increasingly thirsty when drinking sea water.
- B. As the concentration of ATP increases, the rate of glucose breakdown decreases.
- C. An inadequately dressed person's exposure to low temperatures results in a decrease of body heat production.
- D. The elevated body temperature characteristic of a fever causes an increase in the rate of cellular respiration which further elevates body temperature.

Use the following information to answer question 10.



10. If a molecule similar to H attaches itself to enzyme Y, we might expect

- A. fewer J molecules because of competitive inhibition
- B. more J molecules because of competitive inhibition
- C. fewer J molecules because of feedback inhibition
- D. more J molecules because of feedback inhibition

11. Ulcers may result from

- A. decreased amounts of mucus on the stomach wall
- B. low secretions of gastrin from the stomach
- C. reduced acidity at the stomach wall
- D. amylase digesting the stomach wall

12. The hydrolysis of carbohydrates yields

- A. glycerol
- B. fatty acids
- C. amino acids
- D. simple sugars

13. One of the functions of the liver is to

- A. store bile
- B. store gastrin
- C. produce lipase
- D. produce an emulsifier

14. Which statement **MOST** accurately describes vitamins required by humans?

- A. They are important sources of energy for body cells.
- B. They are inorganic substances synthesized in the body.
- C. They are organic substances that are obtained mostly from the diet.
- D. They are necessary components of all proteins synthesized in the body.

Use the following information to answer question 15.

The table shows observations obtained when two unknown food samples were each subjected to four different tests. Each observation was obtained by combining a food sample with a testing agent.

Food Sample	Biuret Test	Iodine Test	Benedict's Test	Sudan IV Test
I	violet	amber	orange	Sudan IV dissolved
II	light blue	black	yellow	Sudan IV dissolved

15. The similarity between food samples I and II is that **BOTH**

- A. contain sugar
- B. contain starch
- C. lack proteins
- D. lack lipids

16. The function of bicarbonate ions during digestion is to

- A. activate the enzymes of the small intestine
- B. increase the pH of the contents coming from the stomach
- C. decrease the pH of the contents entering the small intestine
- D. increase the alkalinity of the contents in the large intestine

Use the following information to answer question 17.

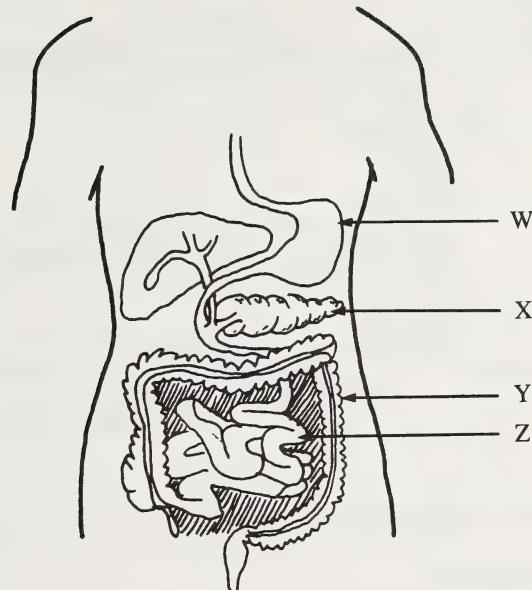
Regions of the Digestive System	Substances Acted Upon	pH	Amount Processed
I	lipids/proteins/carbohydrates	7.5	90 - 100%
II	carbohydrates	7.0	0 - 3%
III	proteins	2.0	90 - 100%
IV	fibres/minerals/water	8.0	20 - 80%

17. Food being processed by the body moves through the regions of the digestive system in a sequence different from that shown in the chart. The correct sequence would be

- A. II, I, IV, and III
- B. II, III, I, and IV
- C. IV, I, II, and III
- D. III, I, II, and IV

Use the following information to answer question 18.

Human Digestive System

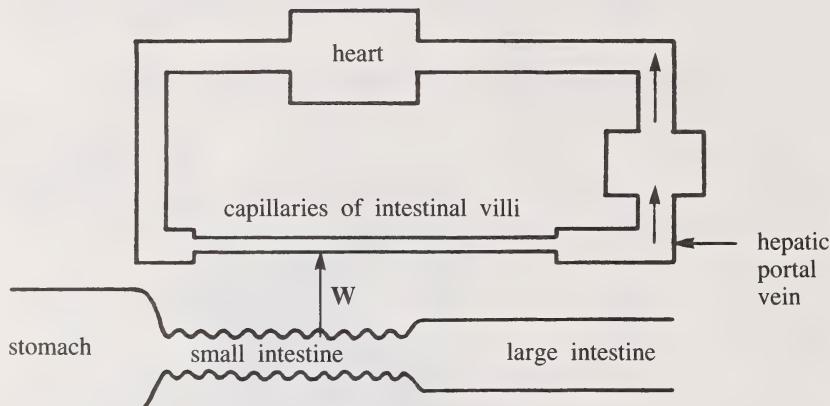


18. The completion of digestion and the absorption of nutrients are functions of the organ labelled

- A. W
- B. X
- C. Y
- D. Z

Use the following information to answer question 19.

A Model Representing the Circulatory and Digestive Systems



19. The process represented by arrow W is

- A. absorption
- B. filtration
- C. digestion
- D. excretion

20. Dehydration of body tissues would result if water absorption were prevented in the

- A. liver
- B. pancreas
- C. esophagus
- D. large intestine

21. Digested food is sometimes absorbed from the digestive tract at a rate faster than can be explained by diffusion alone. This would suggest that

- A. adrenalin has been released, thus increasing peristalsis
- B. cells lining the small intestine are expending energy to absorb materials
- C. the sympathetic nervous system has been stimulated, thus decreasing peristalsis
- D. the parasympathetic nervous system has been inhibited, thus increasing peristalsis

Use the following information to answer question 22.

A biology student was provided with samples of starch, potato, bread, distilled water, and three unknown samples labelled X, Y, and Z. In addition, the student was given an iodine solution and instructed to determine if the unknown samples contained starch. The student placed the samples in separate test tubes, added four drops of iodine solution to each, and recorded the following observations:

<u>Sample</u>	<u>Color after adding iodine solution</u>
starch	dark blue
potato	blue-black
bread	dark blue
distilled water	yellowish
X	dark blue
Y	blue-black
Z	red-brown

22. A control used in this experiment was

- A. sample X
- B. sample Y
- C. the distilled water
- D. the iodine solution

Use the following information to answer question 23.

A researcher investigating gastric secretions in dogs made the following observations:

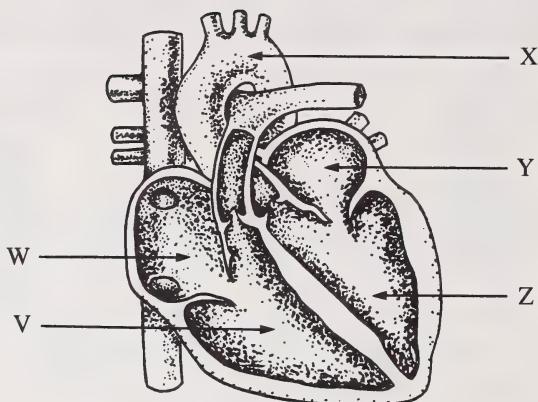
- 1. The presence of food in the mouth caused gastric secretion even before the food reached the stomach.
- 2. The mere sight and smell of food caused gastric secretion.
- 3. When the nerves from the stomach to the brain were cut, gastric secretion did not begin until the food entered the stomach, and then secretion was below the normal level.

23. Which assumption would MOST LIKELY follow from these observations?

- A. The nervous system alone controls the secretion of gastric juice.
- B. The secretion of gastric juice depends only on the senses of sight and smell.
- C. The presence of food in the stomach alone controls the secretion of gastric juice.
- D. The nervous system and the presence of food in the stomach both control the secretion of gastric juice.

Use the following information to answer question 24.

Human Heart



24. The vessels or chambers that contain the highest percentage of oxygenated blood are

- A. V, W, and Z
- B. V, Y, and Z
- C. W, X, and Z
- D. X, Y, and Z

25. If the blood pressure in the aorta increases, then the

- A. heart rate will increase
- B. blood vessels will constrict
- C. heart rate centre will be unaffected
- D. stretch receptors will be stimulated

26. A blood vessel is classified as a vein if it transports blood

- A. rich in O_2
- B. rich in CO_2
- C. to the heart
- D. from the heart

27. The heart rate can be directly altered by a stimulus which originates in the

- A. pons
- B. pituitary
- C. cerebellum
- D. medulla oblongata

28. The contraction of the left ventricle results in blood being pumped into the

- A. aorta
- B. vena cava
- C. pulmonary vein
- D. pulmonary artery

29. An increased heart rate may be a response to

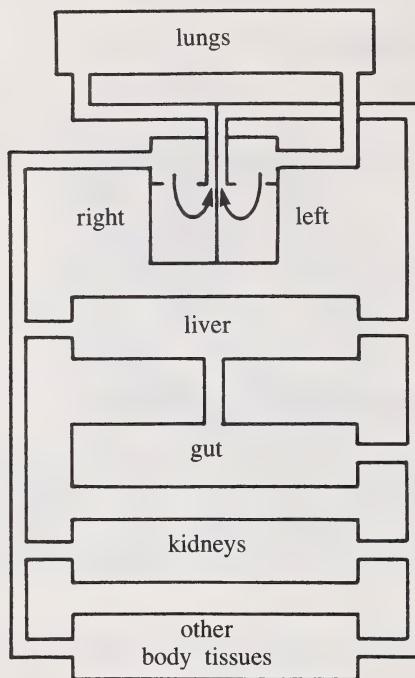
- A. high pH and high oxygen concentrations in the blood
- B. low carbon dioxide and high oxygen concentrations in the blood
- C. high carbon dioxide and low oxygen concentrations in the blood
- D. low levels of thyroxin and high oxygen concentrations in the blood

30. Introduction of foreign protein into the human bloodstream will result in the production of

- A. antigens by leukocytes
- B. antigens by erythrocytes
- C. antibodies by leukocytes
- D. antibodies by erythrocytes

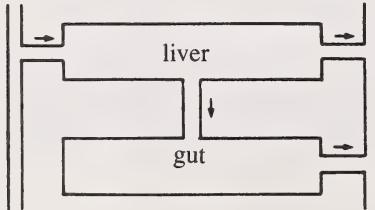
Use the following information to answer question 31.

Model of the Circulatory System

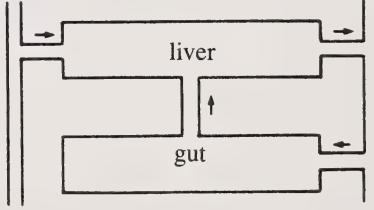


31. The diagram that shows the normal direction of blood flow through the liver and gut is

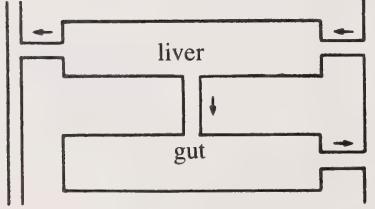
A.



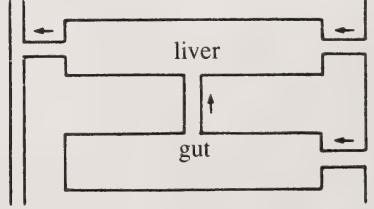
B.



C.

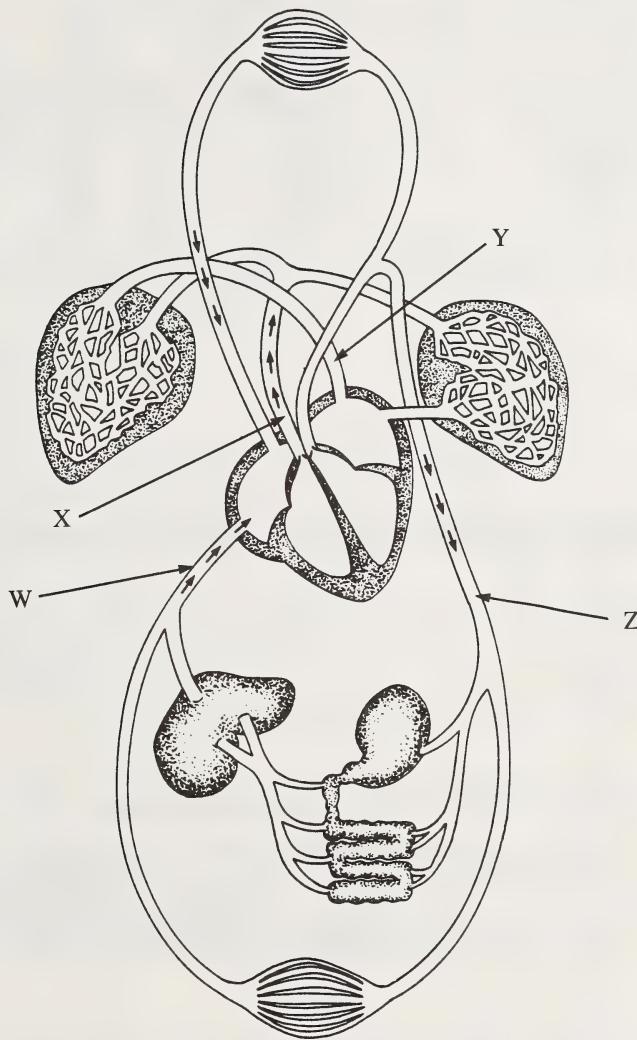


D.



Use the following information to answer question 32.

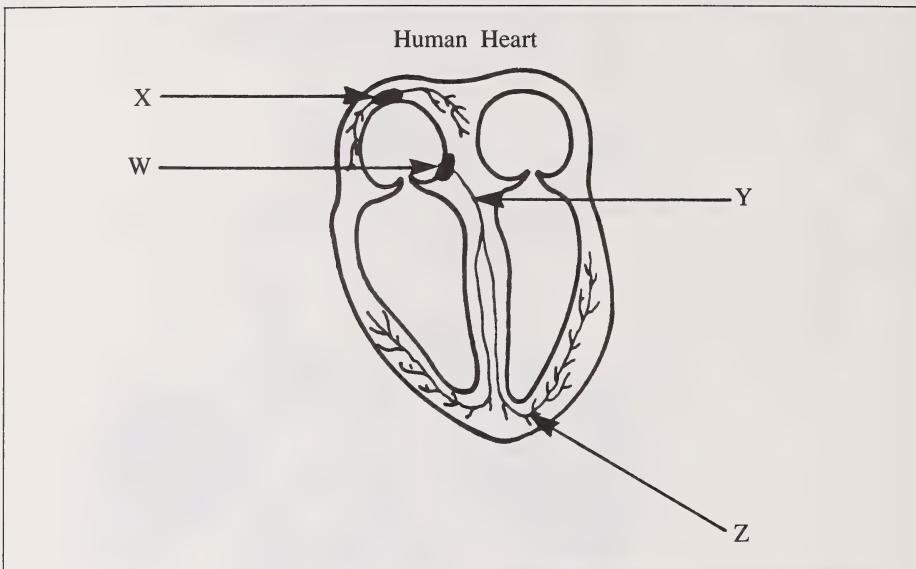
Circulation in the Human Body



32. A vena cava is represented by the structure labelled

- A. W
- B. X
- C. Y
- D. Z

Use the following information to answer question 33.



33. The stimuli necessary to maintain a rhythmic heartbeat originate in the structure labelled

- A. W
- B. X
- C. Y
- D. Z

34. A person suffering from arteriosclerosis (hardening of the arteries) has

- A. low blood pressure because the arteries have decreased elasticity
- B. high blood pressure because the arteries have decreased elasticity
- C. low blood pressure because the arteries have increased their ability to stretch
- D. high blood pressure because the arteries have increased their ability to stretch

Use the following information to answer question 35.

Characteristics of Three Kinds of Blood Vessels

Vessel I

- smallest diameter
- no valves
- walls are one cell thick

Vessel II

- no valves
- greatest elasticity
- high blood pressure

Vessel III

- largest diameter
- valves present
- squeezed by contraction of skeletal muscles

35. A red blood cell is travelling from the left ventricle to the right atrium. What is the sequence of vessels that the red blood cell would follow?

A. II, I, III
B. II, III, I
C. III, II, I
D. III, I, II

36. Which blood component is more abundant in the pulmonary artery than in the pulmonary vein?

A. Carbaminohemoglobin
B. Red blood cells
C. Oxyhemoglobin
D. Platelets

37. Carbon monoxide is poisonous because it

A. destroys mitochondria
B. forms stable bonds with oxygen
C. breaks down alveolar membranes
D. forms stable bonds with hemoglobin molecules

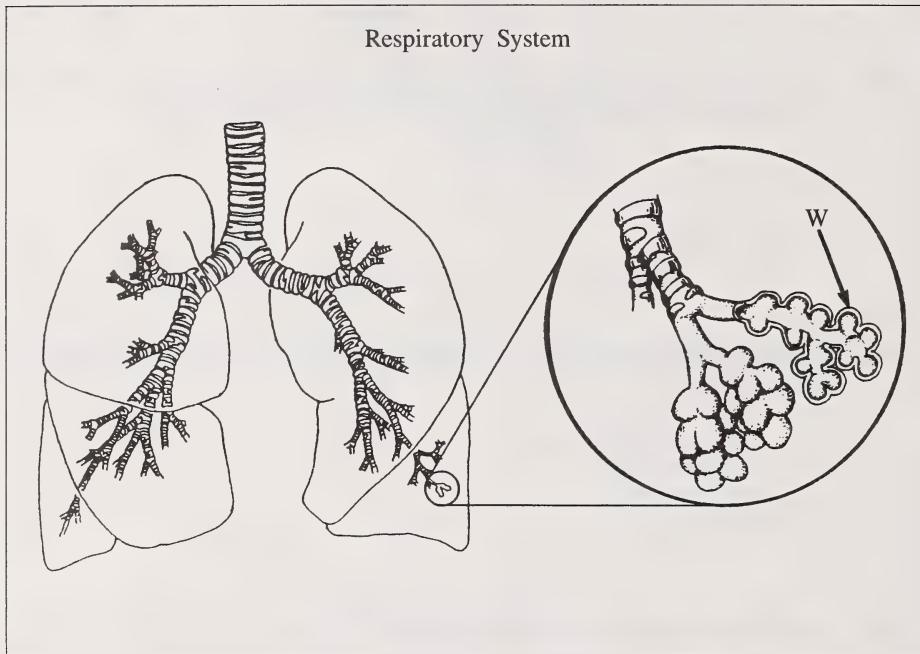
38. The sequence of structures through which air passes during EXHALATION is

A. trachea, alveoli, bronchi
B. bronchioles, bronchi, alveoli
C. trachea, bronchi, bronchioles
D. bronchioles, bronchi, trachea

39. Carbon dioxide is a metabolic waste product and is transported by the blood PRIMARILY as

- A. carbaminohemoglobin and urea
- B. oxyhemoglobin and carbonic acid
- C. carbaminohemoglobin and bicarbonate ions
- D. oxyhemoglobin and dissolved carbon dioxide

Use the following information to answer question 40.



40. The function of the structure labelled W is to

- A. exchange gases with the blood
- B. concentrate oxygen in the blood
- C. bring oxygen to the exchange sites
- D. decrease surface area for gas exchange

41. A puncture through the chest wall, but not through the lungs, will MOST LIKELY cause

- A. no measurable differences in the rate of O_2 absorption by capillaries because no damage has been done to the lungs
- B. an increase in the rate of O_2 absorption by the capillaries because O_2 will now enter the body through an additional opening
- C. a decrease in the amount of O_2 inhaled into the lungs because there will no longer be a pressure difference between the chest cavity and the external environment
- D. a decrease in the rate of O_2 absorption by the capillaries because there will now be a continuous flow of O_2 outward through the puncture in the chest wall

42. Cellular respiration refers to

- A. moving air in and out of the body
- B. the production of ATP from energy-rich molecules
- C. the movement of O_2 carried by hemoglobin in the blood
- D. taking in CO_2 and giving off O_2 through cell membranes

43. The substance that acts as the final electron acceptor in aerobic respiration is

- A. water
- B. oxygen
- C. glucose
- D. carbon dioxide

44. What are the products of cellular respiration in a living tissue culture when maintained in a glucose solution with adequate oxygen?

- A. CO_2 and H_2O
- B. Lactic acid and ATP
- C. Lactic acid and H_2O
- D. Pyruvic acid and CO_2

45. Perspiration occurs during vigorous exercise because

- A. muscle tissue releases water
- B. muscle tissue releases lactic acid
- C. cellular respiration produces heat
- D. cellular respiration produces carbon dioxide

46. Most reabsorption of glucose in the nephron occurs in the

- A. distal tubule
- B. loop of Henle
- C. proximal tubule
- D. collecting ducts

47. A function of aldosterone in the body is to

- A. help regulate urea formation
- B. help regulate the body fluid volume
- C. stimulate the oxidation of amino acids
- D. stimulate the adrenal glands to produce adrenalin

48. Most of the glomerular filtrate that enters a nephron is

- A. converted to urea
- B. retained in the glomerulus
- C. excreted through the bladder
- D. reabsorbed into the capillaries

49. In an insulin-deficient human, there is excretion of glucose in the urine even though the diet is carbohydrate-free. This observation is explained by the fact that

- A. urea is either manufactured or stored in the liver
- B. amino acids are converted by the liver into glucose
- C. amino acids are synthesized in the liver from glucose
- D. glucose is continually manufactured in the liver from carbon dioxide and water

50. If a person has a damaged pituitary gland and has lost the ability to secrete ADH, the urine would have a high concentration of

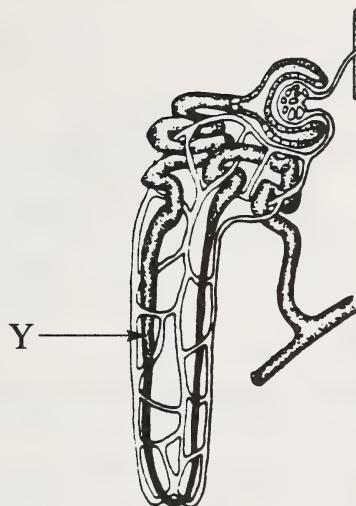
- A. protein
- B. glucose
- C. water
- D. urea

51. After an individual drinks large quantities of water, the blood becomes slightly diluted. The body immediately reacts by

- A. increasing the secretion of ADH
- B. decreasing the secretion of ADH
- C. increasing the secretion of aldosterone from the adrenal glands
- D. reabsorbing more sodium ions from the filtrate of the nephron into the blood

Use the following information to answer question 52.

Nephron

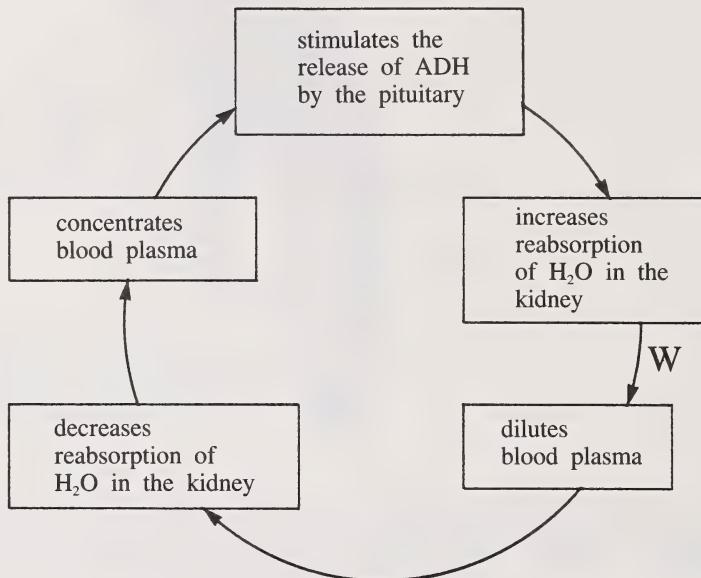


52. Removal of chloride ions and sodium ions from the filtrate in structure Y allows for

- A. the secretion of glucose into the distal tubule
- B. further reabsorption of all filtrate components
- C. further reabsorption of water in the distal tubule
- D. the secretion of nitrogenous wastes into the distal tubule

Use the following information to answer question 53.

Urine Output and Blood Pressure



53. The most likely occurrence at W is

- A. a decrease in urine output and a decrease in blood pressure
- B. a decrease in urine output and an increase in blood pressure
- C. an increase in urine output and a decrease in blood pressure
- D. an increase in urine output and an increase in blood pressure

54. In the kidney, active transport occurs when

- A. glucose molecules move from the glomerulus to Bowman's capsule
- B. amino acids are reabsorbed into the blood from the proximal tubule
- C. small particles are separated from large particles by the capsule of the nephron
- D. water moves from a region of lower solute concentration to one of a higher solute concentration through a selectively permeable membrane

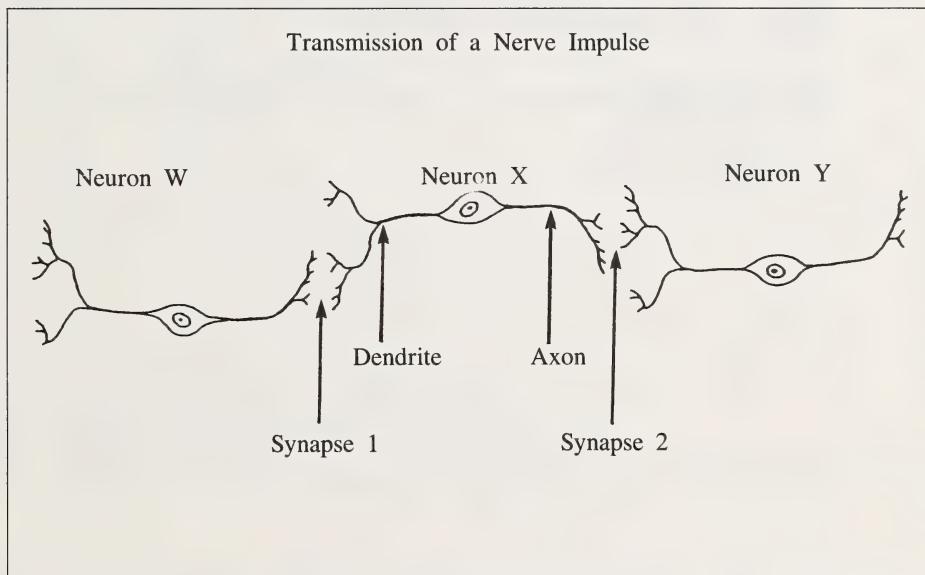
55. The highest concentration of cone cells in the eye is at the

- A. cornea
- B. optic nerve
- C. fovea centralis
- D. periphery of the retina

56. An impulse in a motor neuron would be expected to travel from the

- A. spinal cord to a muscle
- B. spinal cord to the brain
- C. effector to the spinal cord
- D. receptor to the spinal cord

Use the following information to answer question 57.



57. If the axon of neuron X is stimulated at threshold level,

- A. neuron W will also be stimulated
- B. neurons W and Y will both be stimulated
- C. acetylcholine will move across synapse 2
- D. acetylcholine will move across both synapses 1 and 2

58. The hormone that helps regulate growth, development, and utilization of glucose and oxygen by cells is

- A. ADH
- B. insulin
- C. thyroxin
- D. adrenalin

59. In humans, most endocrine feedback mechanisms are regulated by the

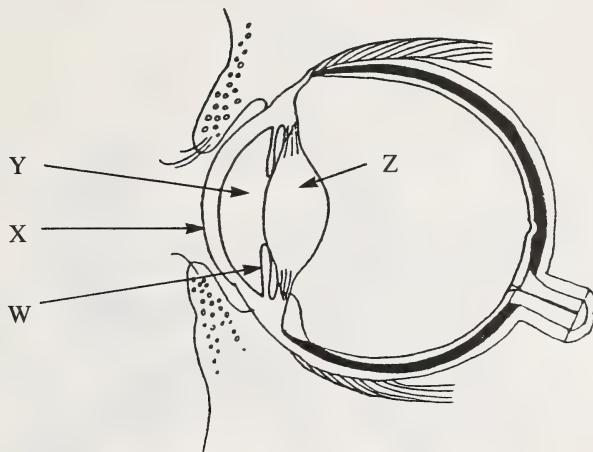
- A. medulla oblongata
- B. pituitary
- C. adrenals
- D. thyroid

60. When a neuron is stimulated at threshold level, the time required to return to its original electrochemical state is known as the

- A. resting period
- B. action potential
- C. refractory period
- D. threshold potential

Use the following information to answer question 61.

The Human Eye



61. The structure which controls the amount of light entering the eye is labelled

- A. W
- B. X
- C. Y
- D. Z

62. When the blood sugar levels drop,

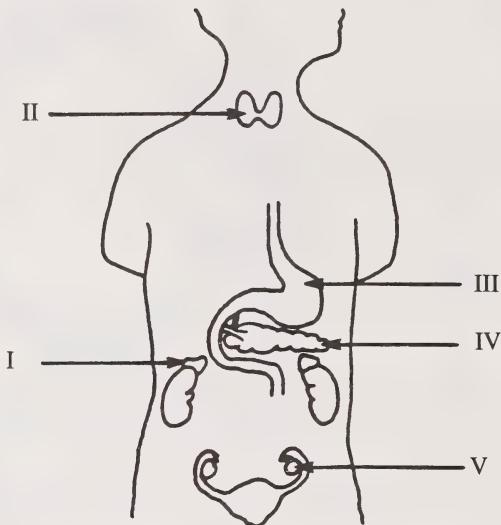
- A. secretin is produced to stimulate glycolysis
- B. adrenalin allows the muscle to absorb more glucose
- C. insulin secretion is increased to raise blood sugar levels
- D. glucagon is secreted to stimulate the breakdown of liver glycogen into glucose

63. Should a person lose the ability to interpret visual images, one might suspect damage to the

- A. cerebrum
- B. cerebellum
- C. hypothalamus
- D. medulla oblongata

Use the following information to answer questions 64 and 65.

Endocrine System



64. Blood glucose levels are LEAST affected by the structure labelled

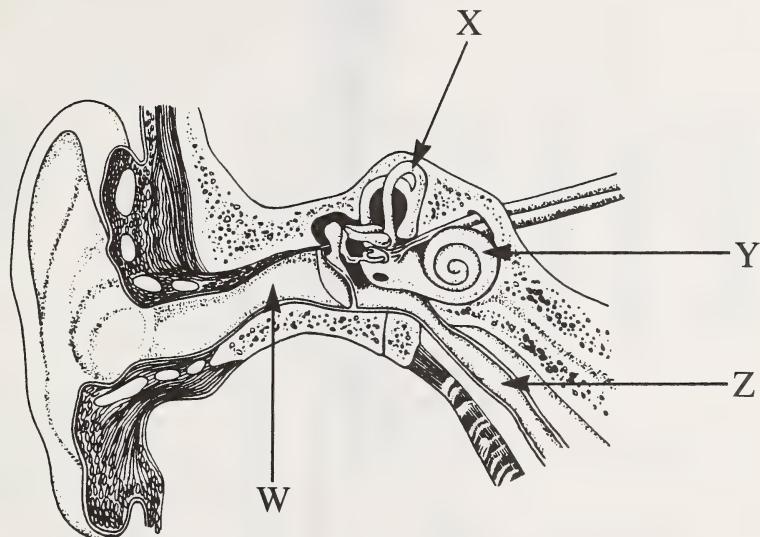
- A. I
- B. II
- C. III
- D. IV

65. The structure which secretes BOTH enzymes and hormones is labelled

- A. I
- B. II
- C. IV
- D. V

Use the following information to answer question 66.

Structures of the Human Ear

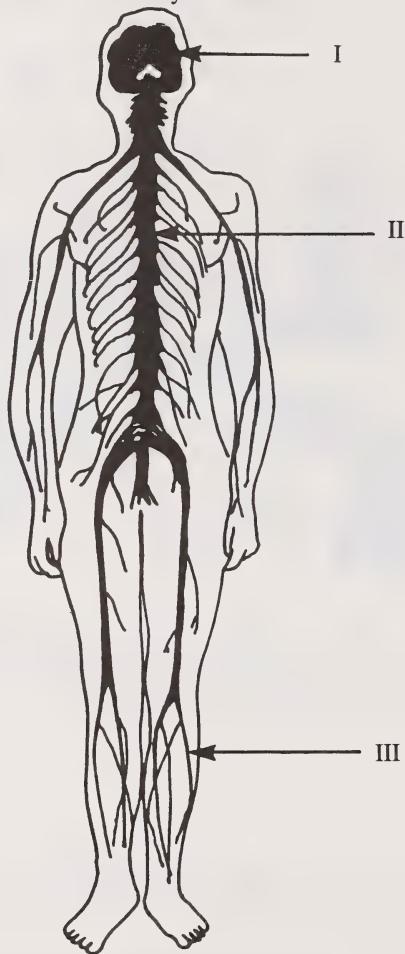


66. The structure that is responsible for equalizing pressure between the external environment and the middle ear is labelled

- A. W
- B. X
- C. Y
- D. Z

Use the following information to answer question 67.

Nervous System

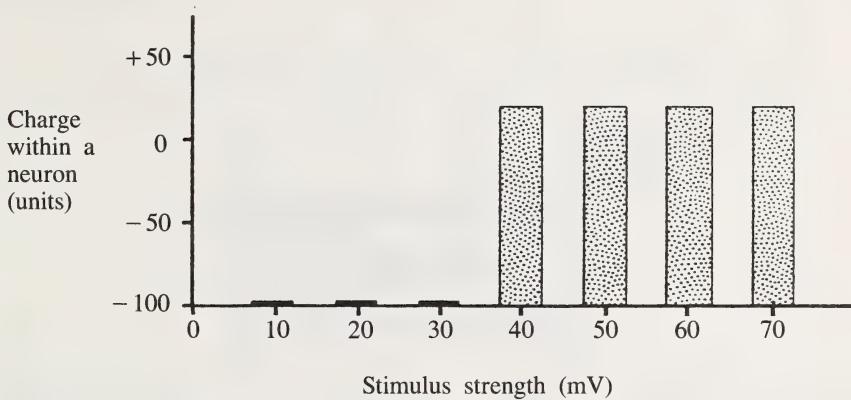


67. In the diagram, the peripheral nervous system is identified by

- A. II only
- B. I and II
- C. III only
- D. II and III

Use the following information to answer question 68.

The graph represents a neuron responding to different strengths of electrical stimuli at the same location on the neuron.

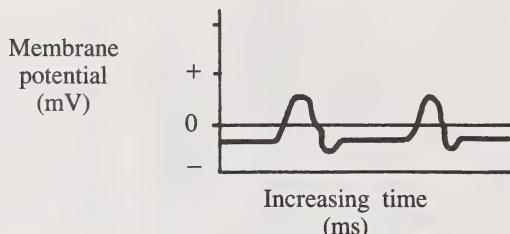


68. The results of the test demonstrate that

- A. the threshold level increases with increased strength of stimulus
- B. nerve impulse strength is directly proportional to stimulus strength
- C. depolarization is not controlled by stimulus strength
- D. the “all-or-none” principle is in effect

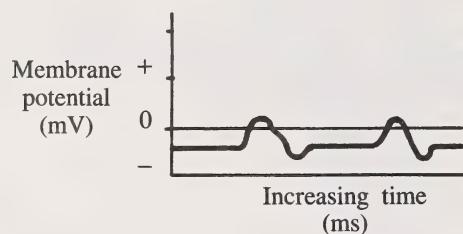
Use the following information to answer question 69.

The following diagram shows nerve impulses recorded on an oscilloscope (a device used to measure voltage) when a neuron is stimulated twice at its threshold level.

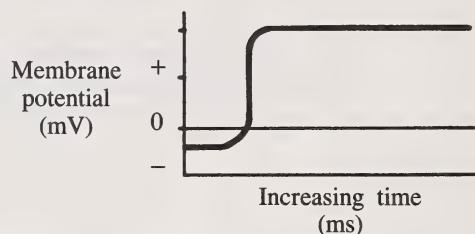


69. If the strength of the stimulus were doubled but the frequency of stimulation remained the same, the oscilloscope reading would MOST LIKELY resemble

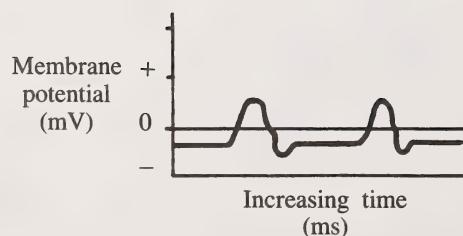
A.



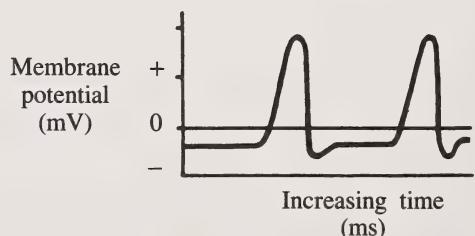
B.



C.



D.

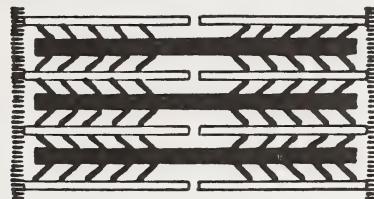


70. Intentional movement of bones is accomplished by

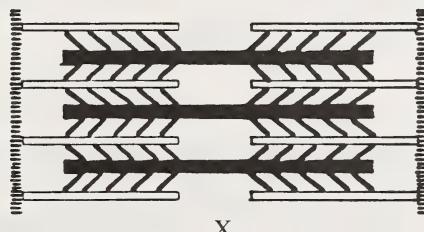
- A. smooth muscles
- B. skeletal muscles
- C. involuntary muscles
- D. non-striated muscles

Use the following information to answer question 71.

Two Stages of Skeletal Muscle Activity



W



X

71. Diagram W represents a

- A. relaxed myosin fibre
- B. relaxed myofibril unit
- C. contracted myosin fibre
- D. contracted myofibril unit

72. The strength of contraction of a muscle depends on the

- A. number of fibres stimulated
- B. arrangement of the myofibrils
- C. intensity of the nerve impulse
- D. thickness of the myelin sheath of the activating neuron

73. In the human male, sperm and urine both travel in the

- A. ureter
- B. urethra
- C. epididymis
- D. vas deferens

74. Structures of the male reproductive system that contribute to the production of semen are the

- A. testes, seminal vesicles, and urethra
- B. seminal vesicles, testes, and scrotum
- C. scrotum, seminal vesicles, and prostate gland
- D. seminal vesicles, Cowper's glands, and prostate gland

75. Adequate viable sperm production is dependent primarily upon

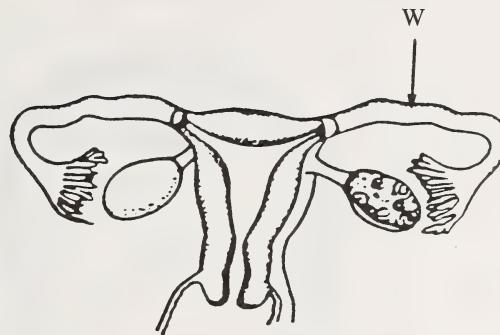
- A. scrotal temperature
- B. internal body temperature
- C. secretions from the prostate gland
- D. hormonal balance of LH and aldosterone

76. Which of the following statements about normal fertilization is true?

- A. Fertilization usually takes place in the uterus.
- B. After sperm penetration, a barrier forms around the egg.
- C. Thousands of sperm cells penetrate an egg during fertilization.
- D. A large number of eggs must be released to ensure successful fertilization.

Use the following information to answer question 77.

Female Reproductive System



77. The process which may occur under normal conditions in the structure labelled W is

- A. ovulation
- B. implantation
- C. menstruation
- D. fertilization

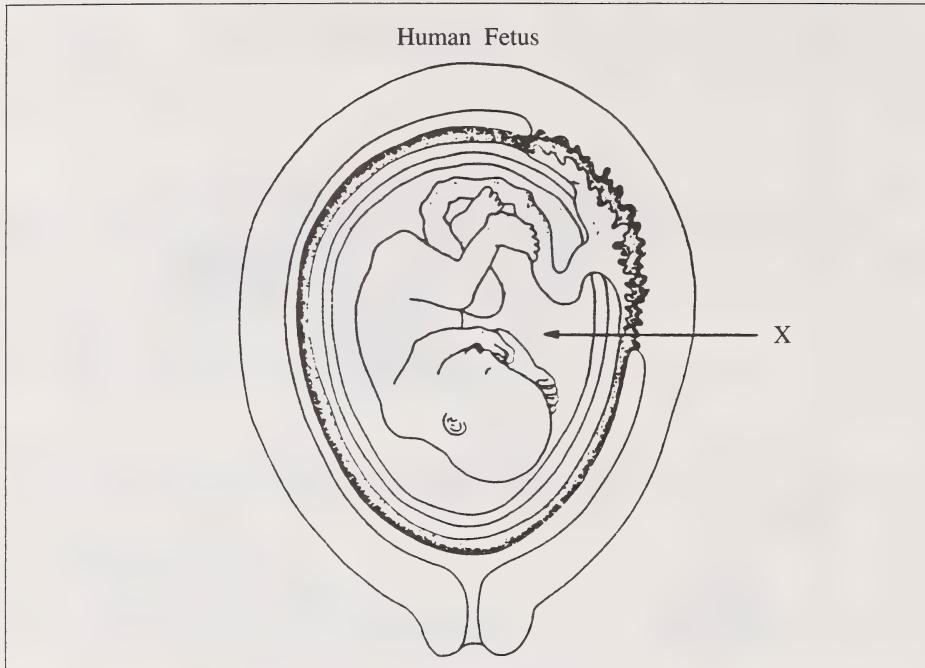
78. The hormone which stimulates the corpus luteum to secrete progesterone is

- A. LH
- B. FSH
- C. TSH
- D. estrogen

79. After the ovaries of an adult were removed surgically, the menstrual cycle terminated due to a lack of BOTH

- A. estrogen and progesterone
- B. LH and progesterone
- C. FSH and estrogen
- D. LH and estrogen

Use the following information to answer question 80.



80. The region labelled X contains

- A. seminal fluid
- B. synovial fluid
- C. amniotic fluid
- D. cerebrospinal fluid

YOU HAVE NOW COMPLETED THE MULTIPLE-CHOICE SECTION OF
THE EXAMINATION. PLEASE PROCEED TO THE NEXT PAGE AND
ANSWER THE WRITTEN-RESPONSE QUESTIONS IN PART B.

PART B

INSTRUCTIONS

Please write your answers in the examination booklet as neatly as possible.

NOTE: The perforated pages at the back of this booklet may be torn out and used for your rough work.

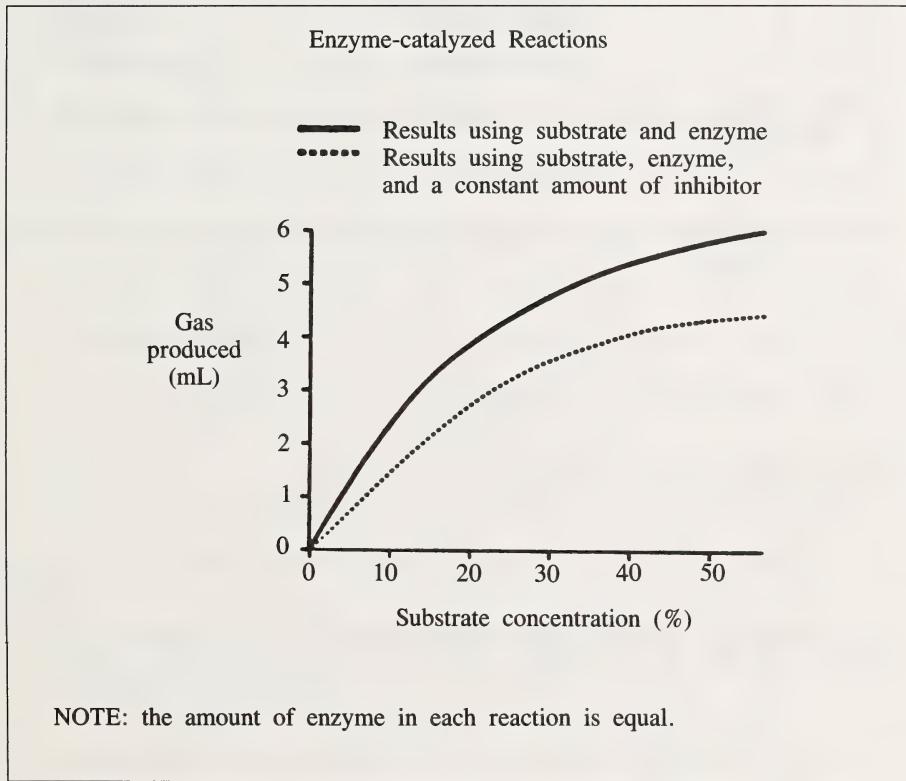
TOTAL MARKS: 20

START PART B IMMEDIATELY

1. Name and describe a method by which particles too large to pass through cell membranes enter cells without the aid of carrier molecules.

(2 marks)

Use the following information to answer question 2.



2. a. What effect does the inhibitor have on the reaction rate?

(1 mark)

b. Explain how the inhibitor causes this effect.

(1 mark)

Use the following information to answer question 3.

A student was given an aqueous solution containing a mixture of a number of organic compounds and was asked to determine what substances were present. The student placed 2 mL of the mixture in each of four test tubes marked W, X, Y, and Z, added the reagents shown, and noted the results. The student repeated the procedure and obtained similar results.

<u>Test Tube</u>	<u>Reagent Added</u>	<u>Results</u>
W	Benedict's solution*	positive
X	Sudan IV powder	negative
Y	Biuret reagent	positive
Z	Iodine solution	negative

*The unknown mixture and the reagent were heated in a hot water bath for one minute.

(1 mark)

3. a. What TWO organic compounds present in the mixture were indicated by the tests?

(i) _____

(ii) _____

(2 marks)

b. Explain each of your choices.

(i) _____

(ii) _____

(2 marks)

4. In preparation for the 1968 Olympics in Mexico City (which is at a high altitude), athletes trained in regions of high altitude. Provide a PHYSIOLOGICAL EXPLANATION as to why these athletes trained at a high altitude.

5. The kidney may be viewed as an organ of retention rather than as an organ of excretion. Identify a substance retained by each of the processes below and explain how it is retained.

a. filtration _____

(2 marks)

b. reabsorption _____

(2 marks)

c. release of ADH _____

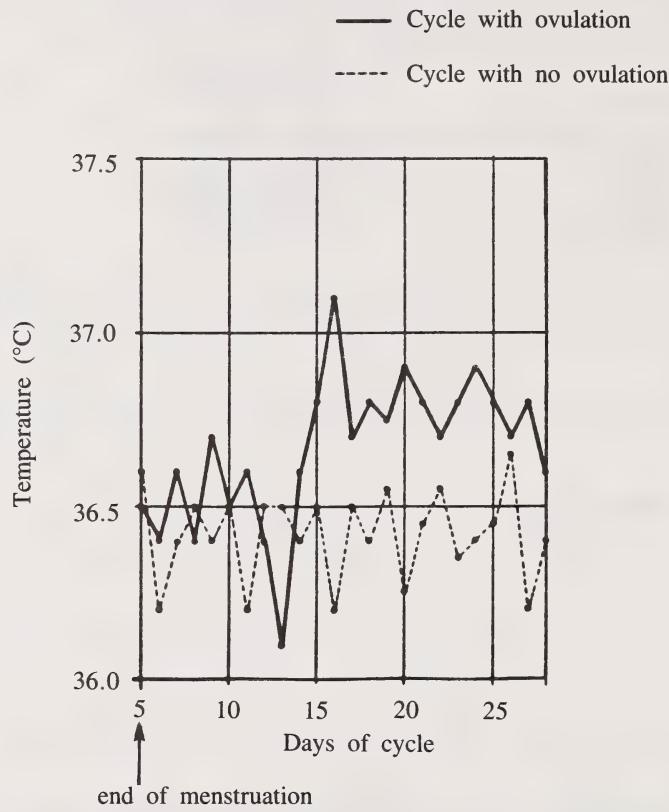
(2 marks)

6. The sympathetic and the parasympathetic nervous systems work together to maintain homeostasis in the human body. Explain how this statement applies to control of the heart rate.

(2 marks)

Use the following information to answer question 7.

Relation Between Body Temperature and the Menstrual Cycle from Days 5 to 28 in a Typical 28 Day Cycle.



(1 mark)

7. a. Compare body temperatures with and without a functioning corpus luteum.

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(1 mark)

b. Describe how body temperature changes just before ovulation.

(1 mark)

c. Describe how body temperature changes just after ovulation.

**YOU HAVE NOW COMPLETED THE EXAMINATION. IF YOU HAVE TIME,
YOU MAY WISH TO GO BACK AND CHECK YOUR ANSWERS.**

(NO MARKS WILL BE GIVEN FOR WORK DONE ON THIS PAGE)

FOLD AND TEAR ALONG PERFORATION

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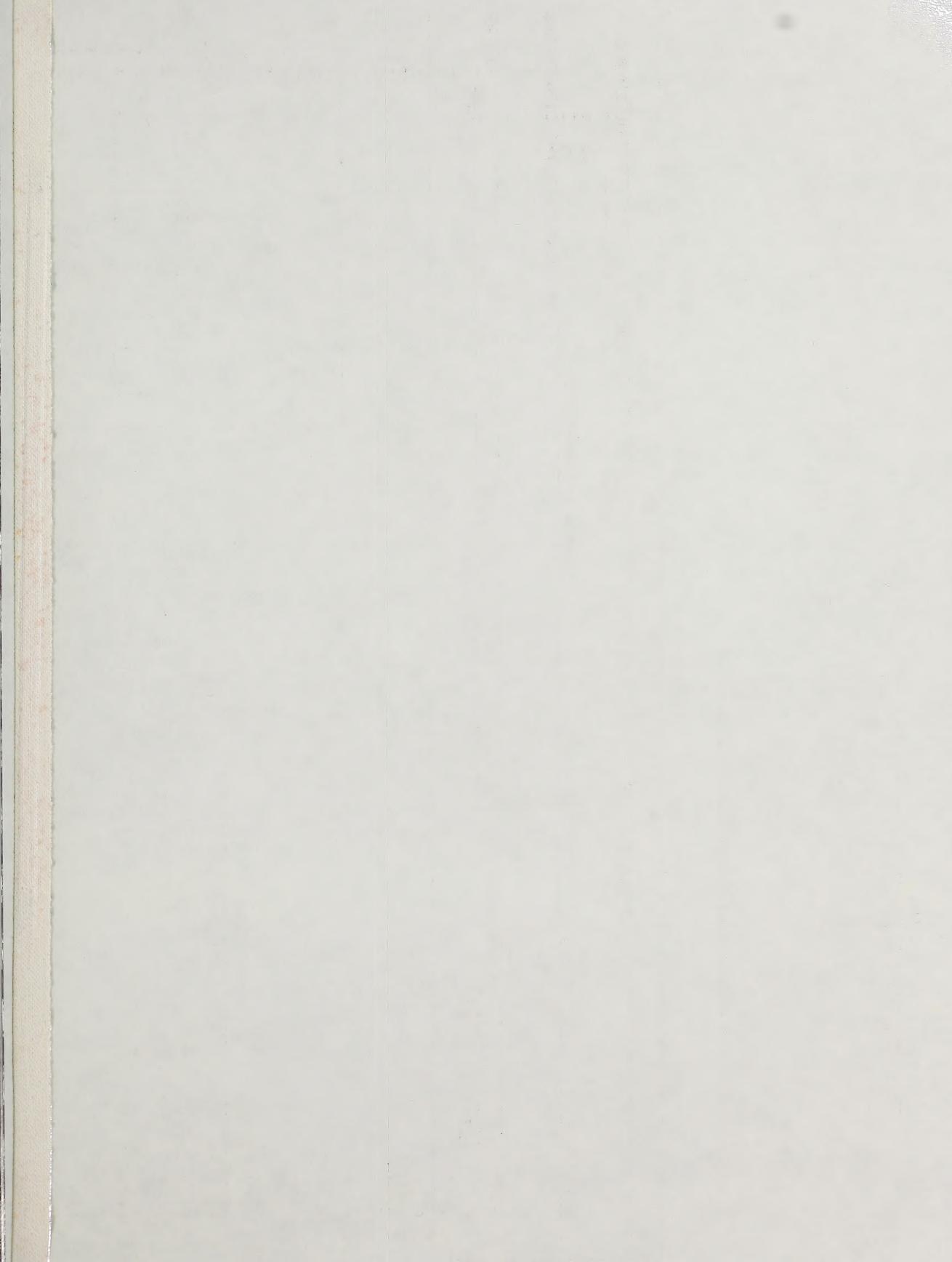
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(LAST NAME)

(FIRST NAME)

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DATE OF BIRTH: SEX:

PERMANENT MAILING ADDRESS: _____

(Apt./Street/Ave./P.O. Box)

(Village/Town/City)

(Postal Code)

SCHOOL CODE: SCHOOL: _____

SIGNATURE: _____

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